METEOROLOGICAL NOTES

STORMS AND FLOODS OF THE PAST SIX WEEKS.—An examination of the Daily Weather Maps published in different countries of Europe for this period is very instructive. The most common course taken by the winter storms of north-western Europe is an easterly or north-easterly one, and the tracks of their centres lie somewhere between Farö and Iceland. Hence the winter climate of the British Isles is characterised by south-westerly winds, and the relatively high temperature and humidity which they bring with them from the Atlantic. This state of things is occasionally varied by the centre of the storm passing in its easterly course across England, along the Channel, or over a track even still further south, resulting in easterly and northerly winds at places situated to the north of the centre track, with the probable accompaniments of sleet, snow, or hail, low temperatures, chill drizzling rains, and heavy seas. Since, however, the storm-centres usually soon pass on to eastward, the easterly winds accompanying them are generally not of long continuance. But during these past six weeks, notably from December 1 to 7, 16 to 24, and 31 to January 7, the cyclonic centres have had their course in the south, or to the south, of the British Islands, and consequently easterly and northerly winds have prevailed, particularly in the north of Great Britain. The cyclonic centres, instead of advancing, as ordinarily happens, to eastward, oscillated backwards and forwards—to eastward and then to westward, to north-westward, and then to south-eastward—being thus continually for days together in the south of the British Islands, and hence the persistency of the easterly winds for several days in succession in the north. Finally, since steep gradients prevailed frequently and for considerable periods from North Britain to Norway, the easterly winds acquired a violence, as well as a persistency, almost unprecedented, strewing the coasts with wrecks, and raising high tempestuous seas, which, particularly when conjoined with the high tides in the beginning of January, damaged harbours and other property to an extent fortunately of rare occurrence in these islands. As frequently happens, gradients were also steep and winds violent over the Channel and the south of England. The snow and rainfalls were also excessive, and blocking up of railways and river floodings, with the inconveniences and disasters attending them, were experienced in all parts except the north-west of Great Britain. At many places the rainfall of December was the heaviest ever recorded. The intimate bearing of the weather of Scandinavia and Lapland on that of Great Britain, and its great scientific importance in forecasting British weather—a point we have on various occasions insisted on in this journal—were several times conspicuously illustrated during the singular weather of these six weeks.

PHYSICS OF THE ATLANTIC OCEAN.—Dr. Buys Ballot has made a valuable contribution to the physics of the Atlantic Ocean in a paper just published on its mean monthly atmospheric pressure. The author wisely groups the observations for each degree of latitude along the outward and homeward bound routes of the Dutch ships on board which the observations were made. The extent and laboriousness of the work will be understood from the fact that for the North Atlantic alone, 175,003 observations have been discussed for the outward, and 163,418 for the homeward bound route. We shall take an early opportunity of reverting to the subject of this paper; in the meantime we content ourselves with heartily recommending the paper more particularly to seamen, from its great utility in navigation, seeing that it gives them the average barometric pressure each month for each degree along this great highway of commerce, which, when intelligently interpreted by the wind which happens to prevail at the time, puts them in possession of information, the importance of which it is impossible to over-estimate.

WEATHER MAPS OF GERMANY.—The Weather Maps of the *Deutsche Seewarte*, in the numbers for January, already received, give on a large scale the barometric curve and the hourly direction and force of the wind for the twenty-four hours previous, as recorded by the self-registering instruments at Hamburg. The value of such data in the study of the daily changes of the weather it is unnecessary to point out. This Office has also begun to publish monthly *résumés* of the weather of the Continent, of which those for January and February, 1876, have appeared, containing short papers by various well-known meteorologists, referring to the weather of the month; and the averages and extremes for the month are briefly but lucidly discussed for all the stations in Germany, and for many other stations in the countries adjoining. A valuable chart is given showing the tracks from day to day of all the European storms of the month.

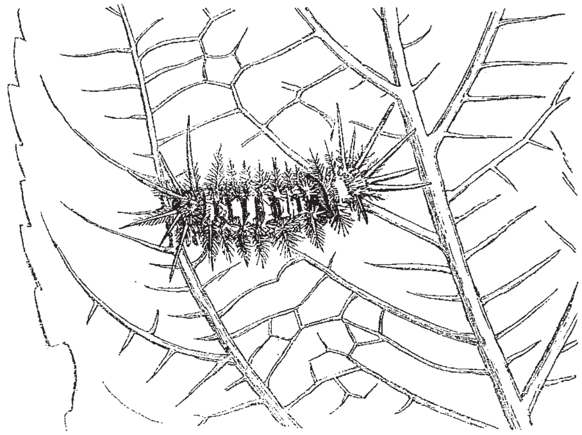
THUNDERSTORMS IN CENTRAL EUROPE.—It was recently shown by M. von Bezold that there is a double maximum in the frequency of summer thunderstorms in particular regions of central Europe. The results of further researches by others seem to point in many cases to a similar behaviour in hydrometeors generally. Thus a double periodicity in hailfall has been demonstrated by M. Prettner for Kärnthen and M. Fournet for the Rhone Valley. And more recently still (*Pogg. Ann.*), Dr. Hellman, having studied the rainfall in North Germany, is led to the following conclusions:—1. There is a double maximum in both the frequency and quantity of rain in the summer months in North Germany. 2. The first maximum falls, in the case of quantity of rain, in the beginning of the second half of June; that for frequency of rain in the beginning of June; the second maximum for both cases in the middle of August. 3. The first maximum is more intense in the case of frequency of rain, and weaker in the case of quantity. Dr. Hellmann offers an explanation of these phenomena, for which, however, we must refer to the original.

SUNSPOTS AND WEATHER.—Prof. Fritz, of Zurich, has shown from a comparison of annual meteorological statistics, that the years distinguished by a maximum of solar spots coincide very closely with those years marked by exceptionally severe hailstorms, and an unusual average height of the great rivers. This law is shown to be in accordance with observations made during the past century in all latitudes, the special periods occurring at intervals of eleven years.

BIOLOGICAL NOTES

CHEMICAL CHANGES OBSERVED DURING PROGRESS OF THE POTATO DISEASE.—The Rev. J. H. Jellett details the results of a series of experiments made to ascertain (1) whether there be any development of sugar during the progresss of the disease, and if so of what kind? (2) whether there be any perceptible change in the quantity of nitrogen? It would appear that the first stage of the disease in the tuber is marked by an increase in the quantity of the nitrogen, which seems to attain its greatest value before the stage of discoloration of the tuber. The same stage of the disease is also marked by the development of sugar, both glucose and sucrose. In the second stage of the disease, marked by a great increase in the discoloured part of the tuber, the part which remains apparently sound shows no increase of nitrogen, but a very considerable increase in the quantity of sugar, while in the discoloured part there is a diminution both in the percentage of nitrogen and of sugar. It will be remarked that the development of the sugar continues for a considerable time after the nitrogen has attained its maximum value. Mr. Jellett has no doubt that the whole of this sugar is formed by the conversion of the potato starch, though he is not aware that there is any known method by which starch can be made to pass into sucrose; possibly this effect may be produced by the presence of the fungus. (*Proc. R. Irish Acad.*, Vol. ii., Series ii. Science, January, 1877.)

Commensalism among Caterpillars.—The following extract from a letter from Fritz Müller, dated Itajahy, Brazil, October 22, has been sent us by his brother, Dr. Hermann Müller, of Lippstadt:—"I have lately become acquainted with an interesting case of commensalism in two caterpillars, of which I inclose a photograph taken by my friend, Scheidemantel. The larger caterpillar, with red head, protected by long branchy stinging-hairs or thorns, lives on mulberry and other trees. Like other caterpillars protected from enemies by odour, stinging-hairs, or otherwise, it sits on the upper side of the leaves, and is light-coloured, the head red, the hairs white. Across its back, between its thorns, there sits a small blackish caterpillar, protecting itself by the thorns of the large companion. I took off the small caterpillar from the large one, but it soon occupied again the same place. In order to take a photograph of it, the larger caterpillar was anæsthetised with ether; it recovered again somewhat, but after two days it died. The smaller caterpillar has now left its place and taken refuge on another caterpillar in the same box; on this it sits somewhat further forward, on the base of the abdomen. In its former host, the place where the small caterpillar sat looks pale, as if it had been scoured. The small caterpillar from above eats small holes in the leaf on which the larger one is sitting. As far as I know, no similar case has hitherto been observed."



Blistering Beetles as a Cure for Hydrophobia.—M. de Saulcy, père, laid before a late meeting of the Entomological Society of France the *débris* of two species of beetles belonging to the Meloidæ (*Meloë tuccius* and *Mylabris tenebrosa*) which had been sent to him from Gabès, in Tunis, by M. de Chevanier, and which constituted the medicine in use by the people of Amerna as a cure for hydrophobia. It is known under the name of *Dernona*, and is mentioned in several Arabian works on medicine. A portion about the weight of a grain of corn is given to the sufferer. The medical formula directs that it should be taken in some meat soup by the person bitten between the 21st and 27th day after the bite; if taken before or after these dates it will not effect a cure. The natives of Amerna seem to have great faith in this cure, and preserve the dried beetles as a treasure. It might be worth while to try a series of experiments on the use of the vesicating beetles in this terrible malady. But it should not be forgotten that so long ago as 1750, Linnæus, in his dissertation, "De Materia Medica in Regno Animali,' suggested the employment in such cases of the common blistering beetle, and in 1856, when M. L. Fairmaire laid before the Entomological Society of France a brochure by M. Saint Hombourg on the treatment of hydrophobia by the administration of a species of Meloë, many of the members then present mentioned that this remedy was known for a very long time in Germany. (*Ann. Soc. Ent. France*, 27 Dec., 1875, *Bulletin*, p. clxiii.)

Carboniferous Amphibia in Nova Scotia.—In the Carboniferous era many of the Sigillarian trees became partly embedded, and as they decayed their inner bark and woody axes crumbled away, leaving open holes on the surface of the ground into which were swept by water, or fell accidentally, the animals of the period together with vegetable *débris*. In this way successive layers of deposit, within the trunks of the trees, became stored with skeletons of Amphibian animals, snails, &c., which they have retained in an admirable state of preservation. Dr. J. W. Dawson, whose former investigations on this subject are well known by all palæontologists, has recently examined a fresh tree-stump about 2 feet high and 18 inches in diameter. In its interior were found no less than thirteen skeletons, more or less complete, belonging to six species, including *Hylerpeton dawsoni*, *Dendrerpeton acadianum*, *D. oweni*, a new species of *Hylerpeton* and *Hylonomus lyelli*. In the last part of the *American Journal of Science and Art*, Dr. Dawson has described these remains.

Action of the Brain.—At a recent *séance* of the French Academy, MM. Giacomini and Mosso presented the photograph of a woman who, from a syphilitic affection of the cranial walls, had lost a great part of the frontal and the two parietal bones. The movements of the brain of this woman (who is now completely cured) had been studied by the graphic method, one of M. Marey's tambours having been applied at the cranial aperture, and some remarkable results were obtained. The traces, which will appear in the *Archivio delle Science mediche*, prove that there are in the brain of man, even during the most absolute repose, three different kinds of movement:—1. *Pulsations*, which are produced at each contraction of the heart; 2. *Oscillations*, which correspond to the movements of the respiration; 3. *Undulations*, which are the largest curves, and are due to movements of the vessels during attention, cerebral activity, sleep, and other causes unknown; they might be called *spontaneous* movements of the vessels. The authors studied the relations between the movements of the brain, the heart contractions, the changes of volume of the forearm and the respiratory movements, by applying simultaneously with the arrangement just described, a pneumograph to the chest, and one of M. Mosso's plethysmographs to the forearm. The form of the brain-pulsation differs considerably from the tracing obtained from the fore-arm, or by means of a sphygmograph applied to an artery. During profound sleep, with snoring, there is considerable increase in the height of the cerebral pulsations, and the respiratory oscillations and the undulations are much more pronounced. Certain causes produce the same change of volume in the brain and in the extremities; others produce variations which are simultaneously in opposition in the brain and in the different parts of the body. The authors describe the effects of compressing the carotid and the jugular, the influence of bodily movements and intellectual labour, which are always reflected in a change of volume of the brain and therefore of its pulsations, and a number of interesting facts are elicited.

Papuan Plants.—So much still remains to be learned regarding the natural productions of New Guinea, that Baron von Mueller's Descriptive Notes on Papuan Plants, will contain much that is new to all botanists. Three successive papers have now been published under this title, the material being chiefly derived from the explorations of Macfarlane, Goldie, and D'Albertis. Von Mueller hopes that one or other of these energetic discoverers will shortly reach the hitherto unknown Alpine heights, which are likely to yield rich stores of endemic species.

NEST-BUILDING FISH.—The habits of those few fishes which build nests for their progeny are very curious, and indicate a highly-developed instinct. One of these, the Gourami (*Asphronemus olfax*), has lately been studied by M. Carbonnier in his private aquarium. The male animal constructs a nest of froth of considerable size, 15 to 18 centimetres horizontal diameter and 10 to 12 centimetres height. He prepares the bubbles in the air (which he sucks in and then expels), strengthening them with mucous matter from his mouth, and brings them into the nest. Sometimes the buccal secretion will fail him, whereupon he goes to the bottom in search of some confervæ, which he sucks and bites for a little, in order to stimulate the act of secretion. The nest got ready, the female is induced to enter. Not less curious is the way in which the male brings the eggs from the bottom into the nest. He seems unable to bring them up in his mouth; instead of this, he first takes in an abundant supply of air, then descending, he places himself under the eggs, and all at once, by a violent contraction of the muscles in the interior of the mouth and pharynx, he forces out the air he had accumulated, by his gills. This air, finely divided or pulverised, in some sort, by the lamellæ and fringes of the gills, escapes in the form of two jets of veritable gaseous powder, which envelops the eggs and raises them to the surface. In this manœuvre, M. Carbonnier says, the Gourami quite disappeared in a kind of air-mist, and when this had dissipated, he reappeared with a multitude of air-bubbles like little pearls, clinging all over his body.

BEAVER IN SIBERIA.—The beaver which, some centuries ago, was so numerous in Russia and Western Siberia, and which was supposed to have totally disappeared from both countries, continues to exist on the rivulet Pelyin. M. Poliakoff has procured from an ostyack on the Obi five skins of these animals killed last year, and he has engaged a hunter to procure this winter complete specimens for the Museum of the St. Petersburg Academy. No farther back than a century ago the beaver was common on one of the affluents of the Irtysh, Bobrofka, but it has now totally disappeared from the locality, the last colony existing probably on the Pelyin.

NOTES

THE first volume of "China," by the well-known geologist Baron von Richthofen, has just appeared. The Berlin Academy of Sciences has granted a generous sum to defray the expense of publishing this costly work.

WE have pleasure in announcing that a new Natural History Journal is about to be started, which is intended to form a bond of union among the various schools belonging to the Society of Friends in this country, both those for boys and girls. Some of the oldest societies of the kind in the country are in connection with these schools, especially the one at York, to which reference has more than once been made in these columns. The journal is intended to be specially devoted to young beginners; the main object being to awaken a personal interest in natural history pursuits, and to induce tyros to make and *record* observations. By this means it is hoped to promote a genuine study in place of the indiscriminate collecting now so much in vogue. Other cognate subjects will also be taken up as space permits, such as chemistry, carpentry, &c. It is intended to publish the first number on February 15; communications, which are warmly invited, should be addressed to J. E. Clark, B.Sc., 20, Bootham, York.

UNDER the title of the "Indian Miscellany," a work is announced by Mr. J. Munsell, of Albany, New York, on the history, arts, inventions, languages, religions, traditions, and superstitions of the American aborigines; with descriptions of their domestic life, manners, customs, traits, governments, wars, treaties, amusements, exploits, &c.; together with sketches of travel and exploration in the Indian country, incidents of border warfare, journals of military expeditions, narratives of captivity, anecdotes of pioneer adventure, missionary relations, &c.

M. ED. BECQUEREL has been elected president of the French Physical Society, which seems, like its English sister society, to be doing excellent work.

THE Council of the Geographical Society of Paris has appointed M. Levasseur president for 1877. MM. Daubrée and Quatrefages have been appointed vice-presidents, and M. Maunoir has been continued general secretary.

IT is stated on good authority that the measurement of the photographs taken by the French parties during the transit of Venus is not progressing favourably. More than 1,000 plates are to be investigated micrographically, and at the present moment only forty-seven have been disposed of. Unforeseen difficulties are said to have arisen.

IN 1828 M. Janson de Sailly, a French barrister who had married a sister of the celebrated Berryer, left by will his fortune to the French University, under the condition of creating a high school in the Quartier des Champs Elysées, to be named Janson College. The will was accepted by the Government, but the heirs tried to get it cancelled, and a law-suit was instituted, which was ended only in December, 1876. The Janson College will be inaugurated in 1878. The legacy is quite adequate to carry out the purpose of the testator, who was proprietor of the greatest part of a large estate.

GERMAN educational statistics show that in Saxony one out of 1,194 of the total male population is in actual attendance upon a university, while in Prussia the proportion is 1 io 1,328.

THE next annual meeting of the *Deutsche geologische Gesellschaft* takes place at Vienna, in September of this year.

THE Council of the Society of Arts have made arrangements for the delivery of six lectures on various scientific subjects, which will take the place of the usual papers and discussions, on six Wednesday evenings during the session. The following gentlemen have each consented to deliver one of the lectures:—Sir John Lubbock, Bart., F.R.S., Mr. E. J. Reed, C.B., M.P., Prof. W. K. Clifford, M.A., F.R.S., Prof. Alexander Kennedy, C.E., Dr. B. W. Richardson, F.R.S., Mr. James Baillie Hamilton.

THE Bremen Geographical Society has received a report from Capt. Wiggins dated Jenissei, November 25, in which he gives more fully the results of his late voyage to Siberia. The Podaratta Bay was found to be exceedingly shallow, and the river itself could not be ascended by craft drawing over two feet of water. Special stress is laid upon the discovery of the channel for sea-going vessels up the picturesque Jenissei as far as Kureika. Numerous observations of the temperature of the air and water, the specific gravity of the latter, &c., were taken during the progress of the voyage. These all tend to show that the Gulf Stream and equatorial currents exert a decided influence much farther to the east than was hitherto supposed, as they pass through the straits of Jugor and Waigat into the Karian Sea.

THE adherence of air round a current of some fluid or liquid when this is forced through the air, has been utilised in various ways, as in water bellows, the blast pipe of locomotives, Sprengel's air-pump, the Bunsen burner, &c. Prof. Teclu, of Vienna, has recently described, in *Poggendorff's Annalen*, a simple arrangement, in which a jet of steam is used to do the work of an air-pump. A small steam boiler containing 1·5 litres of water, and tested to something over one atmosphere, is heated over a gas furnace. It has a safety-valve, which also serves for admission of water when necessary. From above rises a brass steam pipe